SONY

UHF Synthesized Wireless Microphone / UHF Synthesized Transmitter

WRT-810A / WRT-820A

Operating Instructions page 3

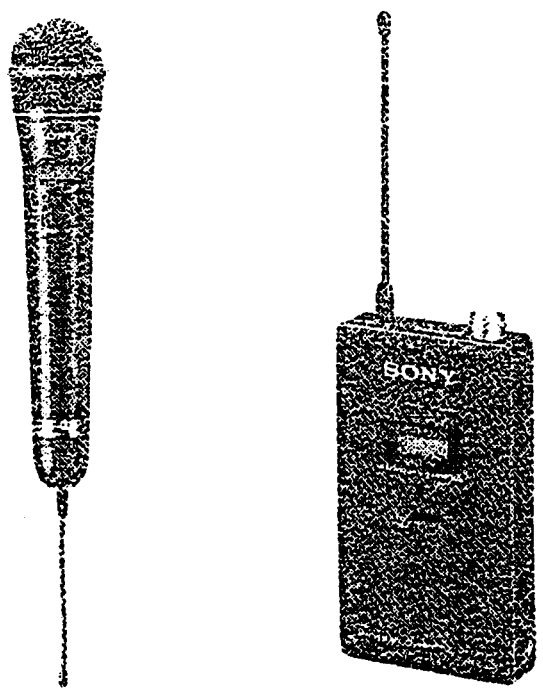
Before using the unit, WRT-810A or WRT-820A, please read this manual thoroughly and retain it for future reference.

Manual de instrucciones página 23

Antes de utilizar las unidades WRT-810A o WRT-820A, lea detenidamente este manual de instrucciones, y consérvelo para futuras referencias.

Mode d'emploi page 43

Lire attentivement ce mode d'emploi avant d'utiliser le WRT-810A ou le WRT-820A, et le conserver pour toute référence ultérieure.



© 1991 by Sony Corporation

Owner's Record

WRT-810A
The model number is located at the grip end and the serial number inside the grip.

WRT-820A
The model and serial numbers are located at the rear of the unit.

Record these numbers in the spaces provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. _____

Serial No. _____

Notice for customers in the U.S.A.
Use of Sony wireless devices is regulated by the Federal Communications Commission as described in Part 74 subpart H of the FCC regulations and users authorized thereby are required to obtain an appropriate license.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Notice for customers in Canada:
Use of Sony wireless devices is regulated by the Department of Communications as described in their Telecommunications Regulatory Circular TRC-78. A licence is normally required. The local district office of DOC should therefore be contacted. When the operation of the device is within the broadcast band, the licence is issued on no-interference, no-protection basis with respect to broadcast signals.

Contents

Introduction 3
Features 5
Precautions 6
Parts Identification 7
Inserting Batteries 9
Changing the Channel Selection 10
Changing the Input Attenuation Setting 12
Using the Microphone/Transmitter 15
Specifications 16
Channels and Carrier Frequencies 18
Block Diagram 21

Introduction

The WRT-810A and the WRT-820A are transmitters for an 800 MHz band UHF synthesized wireless microphone system to be used for broadcast or movie production purposes. The other system components include the AN-820A UHF antenna, the WD-820A UHF antenna divider, and the WRR-820A/840A UHF synthesized diversity tuner.

The microphones/transmitters and tuners are classified by frequency band. See the table on the next page.
A 12 MHz frequency band (or two consecutive-numbered TV channels) is assigned to each microphone/transmitter and tuner model. To indicate the assigned frequency bands, the parenthesized numbers following the model names in the table show the smaller of the assigned TV channel numbers. In building up a UHF wireless microphone system, be sure to combine a microphone/transmitter and a tuner having the same TV channel number.

Frequency band		Model name			
TV channel	Frequency (MHz)				
64	770.125 — 775.875	WRT-810A(64) WRT-820A(64)	AN-820A	WD-820A	WRR-820A(64) WRR-840A(64)
65	776.125 — 781.875				
66	782.125 — 787.875	WRT-810A(66) WRT-820A(66)			WRR-820A(66) WRR-840A(66)
67	788.125 — 793.875				
68	794.125 — 799.875	WRT-810A(68) WRT-820A(68)			WRR-820A(68) WRR-840A(68)
69	800.125 — 805.875				

Features

Easy selection of 94 channels
With its sophisticated phase locked loop (PLL) circuit, the unit can operate on any one of 94 carrier frequencies in a 12 MHz frequency band for each model, selected by a simple button operation.
Each channel is identified by a number consisting of a 2-digit TV channel number and a 2-digit wireless microphone channel number (example: 68-23).
See "Channels and Carrier Frequencies"on page 18 for more details.

Operation powered by widely available batteries
The built-in DC-DC converter allows stable operation, for up to eight hours continuously, with just two L40 (LR6) alkaline batteries.

CPU and LCD for coordinated operation control
The built-in CPU controls the unit operation including the PLL circuit function. The LCD shows the current channel number, the residual battery power, the input attenuation setting, the AF input level and the RF output.

Saved channel and input attenuation settings
The unit stores the channel and the input attenuation settings when it is turned off. The saved settings are retained even if the batteries are removed. Therefore, when using the unit next time, you need not make the same settings again.

Highly reliable electronic attenuator
The built-in input level attenuator is adjustable in the range of 0 to 21 dB in 3 dB steps. It reduces signal distortion when an excessively strong input signal is received.

Handy audio input switch (WRT-810A)
You can use the AF switch of the microphone as a handy audio input ON/OFF switch.

Compatibility with Sony lavalier microphones (WRT-820A)
The transmitter is compatible with Sony lavalier microphones, including the ECM-166BC.

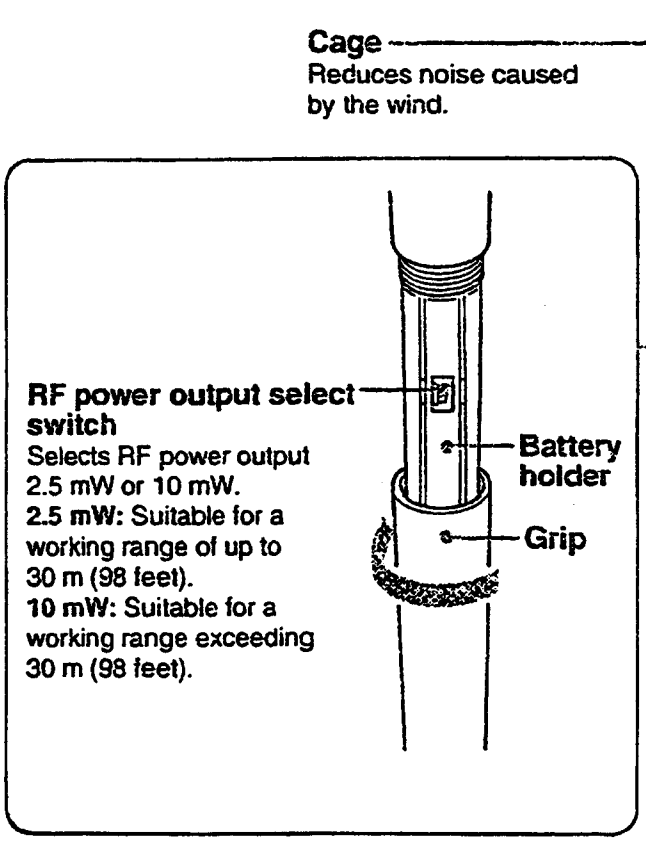
RF carrier with tone signal
The unit transmits the RF carrier accompanied by a tone signal, enabling the tuner with a tone squelch circuit to take out only the target audio signal received.

Wide dynamic range and low noise
The compander (compressor/expander) system enables transmission over a wide dynamic range with minimum noise.

Precautions

- The unit is designed for use in an ambient temperature range of 0°C to 50°C (32°F to 122°F).
- Do not place the unit on or near a heat source such as lighting equipment or a power amplifier, or in a place subject to direct sunlight or excessive moisture. In such places, the external finish or internal parts of the unit may be damaged.
- If the unit is used in a very humid or dusty place or in a place subject to an active gas, clean its surface as well as the connectors with a dry, soft cloth soon after the use. Lengthy use of the unit in such places or not cleaning it after its use in such places may shorten its life.
- When cleaning the unit, never use organic solvents such as thinners or benzine, which will damage the finish of the unit.
- The unit has been factory adjusted precisely. Do not tamper with its internal parts or attempt to repair it.

Parts Identification



RF power output select switch
Selects RF power output 2.5 mW or 10 mW.
2.5 mW: Suitable for a working range of up to 30 m (98 feet).
10 mW: Suitable for a working range exceeding 30 m (98 feet).

Battery holder

Grip

WRT-810A

Cage
Reduces noise caused by the wind.

<Display section>
(See next page)

AF switch
Switches on and off the audio input.

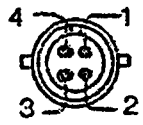
Wire antenna

WRT-820A

Wire antenna

Input connector
Connect the output connector of one of the following optional Sony lavalier microphones:
ECM-44SC/BC
ECM-55SC/BC
ECM-66SC/BC
ECM-77SC/BC
ECM-166BC
You can also use your wired microphone by connecting it to this connector with an optional EC-1.5CF microphone cable.

Pin assignment



1 +5 V output
2 HOT
3 COLD
4 GND

Battery holder

POWER switch
Setting this switch to ON puts the unit in transmission mode, recalling the channel selection and the input attenuation setting. Setting this switch to OFF turns off the unit, saving the channel selection and the input attenuation setting.

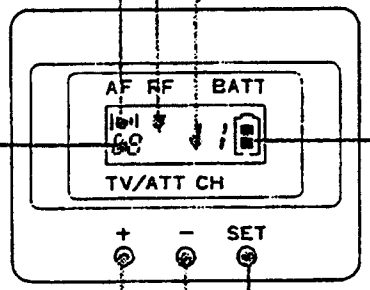
Display section

AF indicator
The indicator appears when the input audio signal level is higher than needed to obtain the reference deviation.

RF indicator
The indicator appears when the RF carrier is being transmitted.

CH indicator
Indicates the current wireless microhpne channel selection in channel display or channel set mode. When the unit is in attenuation display/set mode, this indicator shows "– –".*

TV/ATT indicator
Indicates the current TV channel selection in channel display or channel set mode, or the current input attenuation setting in decibels in attenuation display/set mode.

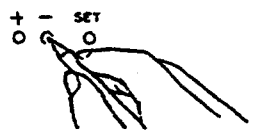


BATT indicator
: The batteries are in good condition.
: The residual battery power is below the 50% level.
: The batteries are exhausted. Replace them.
(When this indicator appears, the whole display starts flashing.)

+/– buttons
Use these buttons to increment or decrement the channel selection in channel set mode or the input attenuation setting in attenuation display/set mode.

SET button
Use this button to enter channel set or attenuation display/set mode.

+/–/SET buttons

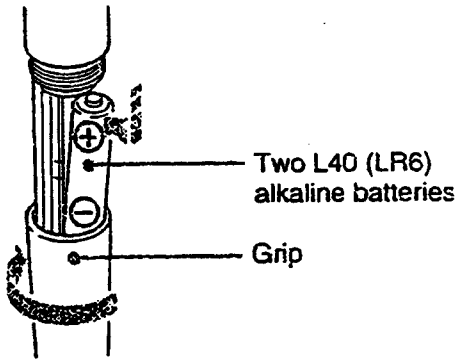


Use a ball-point pen or similar instrument to press these buttons.

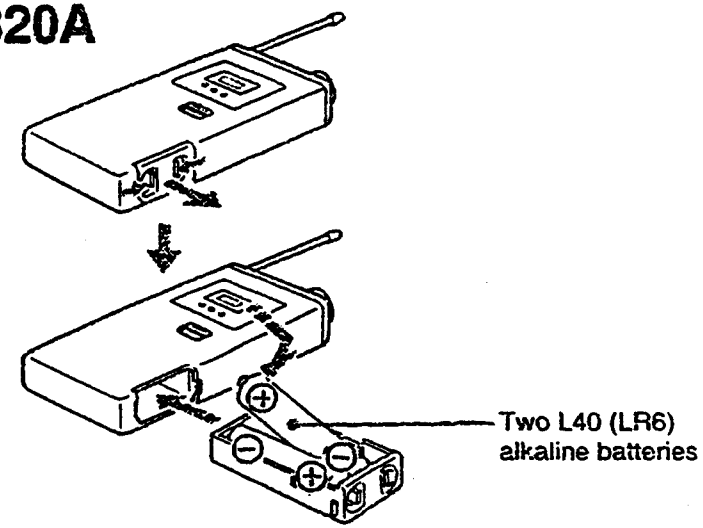
* The example shows TV channel display on the WRT-810A(68) or WRT-820A(68).

Inserting Batteries

WRT-810A



WRT-820A



Notes

- Be sure to turn the POWER switch off before replacing the batteries.
- When the unit is turned on with batteries which are exhausted, the BATT indicator displayed may reflect their temporarily recovered power which will reduce very quickly. Before starting extended operation, replace the batteries in the unit even if the BATT indicator shows [▮] or [▯] .

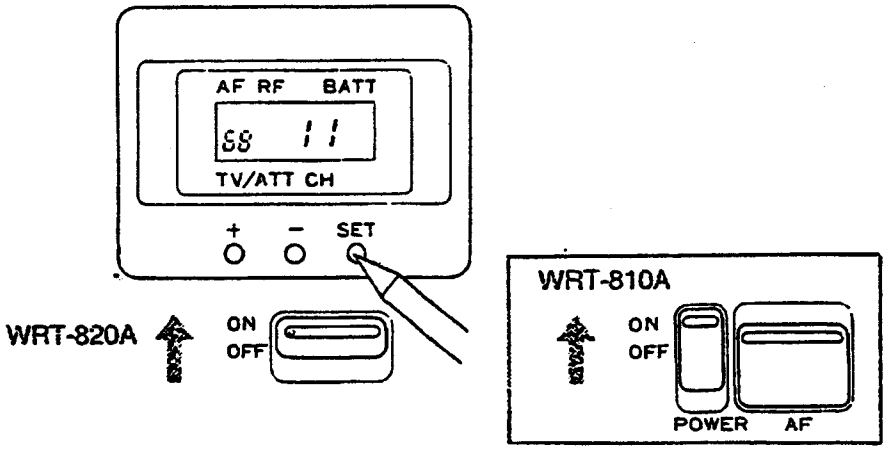
Notes on batteries

- Be sure to insert the batteries with the correct polarity.
- Do not pair different types of battery.
- Always replace the two batteries together.
- The batteries are not rechargeable.
- When keeping the unit out of use for extended periods of time, remove the batteries to avoid leakage.
- Should the batteries be found to have leaked in the unit, replace them with new ones after carefully wiping the leakage from the battery holder or case.

Changing the Channel Selection

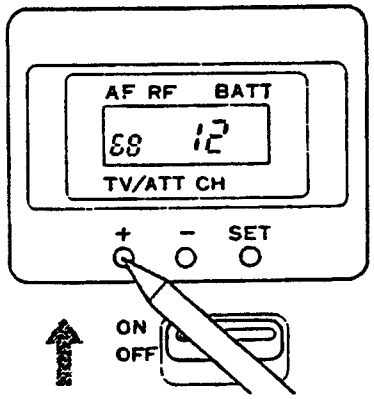
1 While pressing the SET button, set the POWER switch to ON to enter channel set mode.

The current channel selection will appear on the display.



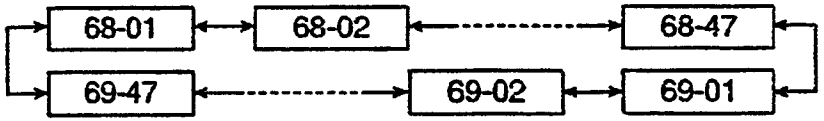
The example shows TV channel display on the WRT-810A(68) or WRT-820A(68).

2 Press the + button to increment the current channel selection or the – button to decrement it.



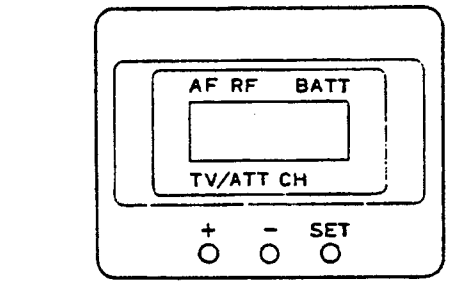
If you keep either button pressed, the channel selection will be incremented or decremented successively.

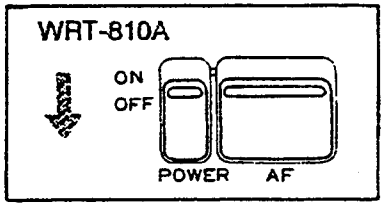
The setting will cycle the channel number from 68-01 through 69-47.



The example shows TV channel display on the WRT-810A(68) or WRT-820A(68).

3 Set the POWER switch to OFF to save the selected channel number along with the current input attenuation setting.





Notes

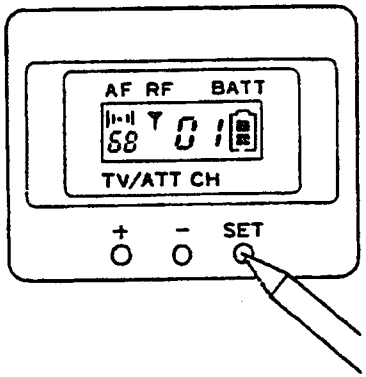
- The unit cannot transmit in channel set mode.
- Make sure that the channel selected is the same as that selected on the WRR-820A/840A unit used in the same system.
- Depending on the noise or interference conditions, the selectable channels may not necessarily all be usable. If necessary, you can determine the usable channels by stepping the channel selection through a number of channels on the tuner with the microphone/ transmitter set to OFF. Those channels on which the RF indicator of the tuner does not light are usable.
- If there is a TV broadcasting station nearby, to avoid possible interference with broadcasing, do not use that station's channel.
- The unit may not operate correctly if it is turned on again immediately after turning off the power while in channel set mode. Pause for a few seconds or more before turning on the power again.

Changing the Input Attenuation Setting

You can change the input attenuation setting in 3-dB steps in the range of 0 to 21 dB.

Raise the setting to decrease the sound volume or lower it to increase the sound volume, using the following procedure:

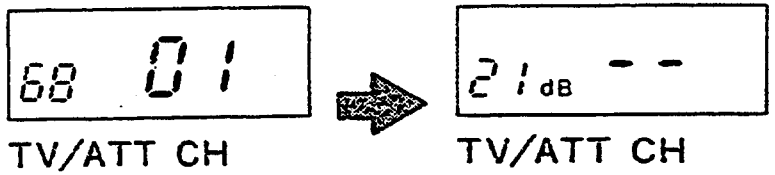
1 When the current channel selection is displayed (that is, when the unit is in either channel set mode or channel display mode), press the SET button to enter attenuation display/set mode.



The current input attenuation setting in decibels will appear on the display.

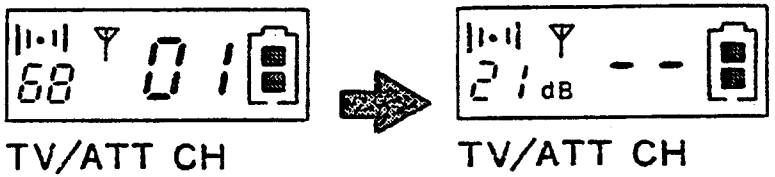
- Switching from channel set mode to attenuation display/set mode

(Channel set mode) (Attenuation display/set mode)



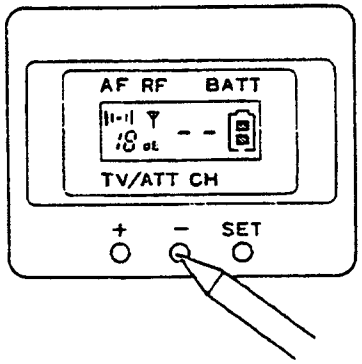
- Switching from channel display mode to attenuation display/set mode

(Channel display mode) (Attenuation display/set mode)



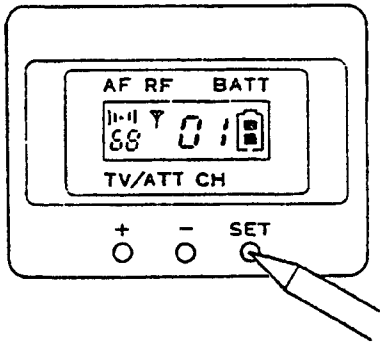
The example shows TV channel display on the WRT-810A(68) or WRT-820A(68).

2 Use the + and – buttons to adjust the attenuation setting.

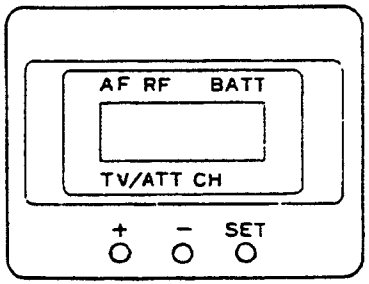


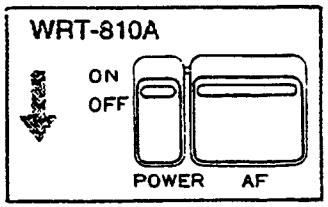
If you keep either button pressed, the input attenuation setting will be incremented or decremented successively until it reaches 0 or 21 dB.

3 Press the SET button to return to the previous mode.



To save the input attenuation setting along with the channel number selected in the preceding channel set mode:
Set the POWER switch to OFF.





The example shows TV channel display on the WRT-810A(68) or WRT-820A(68).

Changing the Input Attenuation Setting

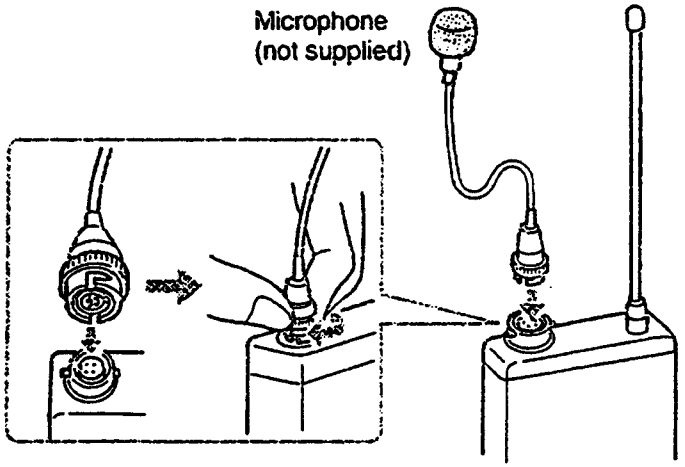
Notes

- After entering attenuation display/set mode by pressing the SET button in channel set mode, if you do not press any button for about five seconds, the unit will return to channel set mode automatically.
- The attenuation display/set mode entered by pressing the SET button in channel display mode will stay until you press the SET button again. If you turn off the unit without returning to channel display mode, the unit saves the status, so that it will enter attenuation display/set mode when turned on next time.
- Even if you keep on pressing the + or – button, the input attenuation setting does not cycle. After being decremented to 0 dB or incremented to 21 dB, the setting stays unchanged unless you change it in the reverse direction.

Using the Microphone/Transmitter

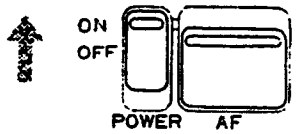
1 Select the channel to be used.
(Use the procedure in "Changing the Channel Selection" on pages 10 and 11.)

2 Connect the lavalier microphone. (For WRT-820A only)



3 Set the POWER switch to ON.

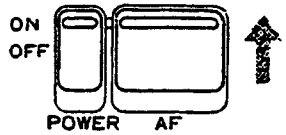
WRT-810A



WRT-820A

4 Set the AF switch to ON. (For WRT-810A only)

WRT-810A



Notes

- To prevent noise generation, keep the microphones and transmitters at least 3 m (10 feet) away from the antennas when the system is operated using a group which allows selection of up to 11 channels, and at least 6 m (20 feet) away when using a group which allows selection of 12 to 19 channels.
- Ensure that the tuners set to channels not being used are either turned off or set to the minimum output level (the LEVEL adjustment knob set to MIN).
- Turning the microphone/transmitter on or off may generate some noise. To minimize the impact of such noise, set the LEVEL adjustment knob of the tuner being used to MIN beforehand.
- Switching the unit on without checking the channel selection first may interfere with the operation of other microphones/transmitters, if the current setting is already being used.
- The WRT-820A unit may be put in the soft case upside down so that its wire antenna points downward.

Specifications

Transmitter and Modulator Section

Oscillator	Crystal controlled PLL synthesizer
Carrier frequencies	94 settings at 125-kHz intervals WRT-810A/820A (64): 770.125 to 781.875 MHz WRT-810A/820A (66): 782.125 to 793.875 MHz WRT-810A/820A (68): 794.125 to 805.875 MHz
Tone signal	32.768 kHz
Type of emission	110KF3E
RF power output	WRT-810A: 10 mW/2.5 mW, selectable (50 ohms) WRT-820A: 10 mW (50 ohms)
Frequency stability	Within ±0.005%
Spurious radiation	Less than 2.5 µW
Type of antenna	1/4 wavelength wire
Pre-emphasis	50 µs
Reference deviation	±5 kHz
Maximum deviation	±40 kHz
Maximum modulation frequency	15 kHz
Frequency response	WRT-810A: 100 Hz to 13 kHz WRT-820A: 100 Hz to 15 kHz
Signal-to-noise ratio	More than 60 dB (A-weighted, with reference deviation at WRR-820A/840A)
Audio distortion	WRT-810A: Less than 1.5% (with reference deviation) WRT-820A: Less than 1.0% (with reference deviation)
Audio attenuator	0 to 21 dB, variable in 3-dB steps

Maximum input sound pressure level (for WRT-810A at 21-dB attenuation)
151 dB SPL

Maximum input level (for WRT-820A at 21-dB attenuation)
–3 dB (0 dB = 1 Vrms)

Microphone unit (WRT-810A)
Uni-directional dynamic type

Power Section

Power requirements	3 V DC (two L40 (LR6) alkaline batteries)
Battery life	About 8 hours at 25°C or 77°F (with Sony AM3 (LR6) alkaline batteries)
Current consumption	Less than 170 mA (at 3 V)

General

Operating temperature	0°C to 50°C (32°F to 122°F)
Storage temperature	–30°C to +60°C (–22°F to +140°F)
Dimensions	WRT-810A: 48 x 238 mm (maximum dia./ length) (1 15/16 x 9 3/8 inches)
	WRT-820A: 63 x 103 x 17 mm (w/h/d) (2 1/2 x 4 1/8 x 11/16 inches)
Weight	WRT-810A: About 300 g (including batteries) (10.5 oz)
	WRT-820A: About 165 g (including batteries) (5.8 oz)
Accessories supplied	WRT-810A: Microphone holder (1) Stand adaptor PF 1/2 to NS 5/8 (1)
	WRT-820A: Soft case (1)

Optional accessories (for use with WRT-820A)

Lavalier microphones
- ECM-44SC/BC
- ECM-55SC/BC
- ECM-66SC/BC
- ECM-77SC/BC
- ECM-166BC

Microphone cable
- EC-1.5CF

Design and specifications are subject to change without notice.

Channels and Carrier Frequencies

WRT-810A/820A (64)

Channel	Frequency (MHz) TV-64 Band	Channel	Frequency (MHz) TV-64 Band	Channel	Frequency (MHz) TV-65 Band	Channel	Frequency (MHz) TV-65 Band
64-01	770.125	64-28	773.500	65-01	776.125	65-28	779.500
64-02	770.250	64-29	773.625	65-02	776.250	65-29	779.625
64-03	770.375	64-30	773.750	65-03	776.375	65-30	779.750
64-04	770.500	64-31	773.875	65-04	776.500	65-31	779.875
64-05	770.625	64-32	774.000	65-05	776.625	65-32	780.000
64-06	770.750	64-33	774.125	65-06	776.750	65-33	780.125
64-07	770.875	64-34	774.250	65-07	776.875	65-34	780.250
64-08	771.000	64-35	774.375	65-08	777.000	65-35	780.375
64-09	771.125	64-36	774.500	65-09	777.125	65-36	780.500
64-10	771.250	64-37	774.625	65-10	777.250	65-37	780.625
64-11	771.375	64-38	774.750	65-11	777.375	65-38	780.750
64-12	771.500	64-39	774.875	65-12	777.500	65-39	780.875
64-13	771.625	64-40	775.000	65-13	777.625	65-40	781.000
64-14	771.750	64-41	775.125	65-14	777.750	65-41	781.125
64-15	771.875	64-42	775.250	65-15	777.875	65-42	781.250
64-16	772.000	64-43	775.375	65-16	778.000	65-43	781.375
64-17	772.125	64-44	775.500	65-17	778.125	65-44	781.500
64-18	772.250	64-45	775.625	65-18	778.250	65-45	781.625
64-19	772.375	64-46	775.750	65-19	778.375	65-46	781.750
64-20	772.500	64-47	775.875	65-20	778.500	65-47	781.875
64-21	772.625			65-21	778.625		
64-22	772.750			65-22	778.750		
64-23	772.875			65-23	778.875		
64-24	773.000			65-24	779.000		
64-25	773.125			65-25	779.125		
64-26	773.250			65-26	779.250		
64-27	773.375			65-27	779.375		

WRT-810A/820A (66)

Channel	Frequency (MHz) TV-66 Band	Channel	Frequency (MHz) TV-66 Band	Channel	Frequency (MHz) TV-67 Band	Channel	Frequency (MHz) TV-67 Band
66-01	782.125	66-28	785.500	67-01	788.125	67-28	791.500
66-02	782.250	66-29	785.625	67-02	788.250	67-29	791.625
66-03	782.375	66-30	785.750	67-03	788.375	67-30	791.750
66-04	782.500	66-31	785.875	67-04	788.500	67-31	791.875
66-05	782.625	66-32	786.000	67-05	788.625	67-32	792.000
66-06	782.750	66-33	786.125	67-06	788.750	67-33	792.125
66-07	782.875	66-34	786.250	67-07	788.875	67-34	792.250
66-08	783.000	66-35	786.375	67-08	789.000	67-35	792.375
66-09	783.125	66-36	786.500	67-09	789.125	67-36	792.500
66-10	783.250	66-37	786.625	67-10	789.250	67-37	792.625
66-11	783.375	66-38	786.750	67-11	789.375	67-38	792.750
66-12	783.500	66-39	786.875	67-12	789.500	67-39	792.875
66-13	783.625	66-40	787.000	67-13	789.625	67-40	793.000
66-14	783.750	66-41	787.125	67-14	789.750	67-41	793.125
66-15	783.875	66-42	787.250	67-15	789.875	67-42	793.250
66-16	784.000	66-43	787.375	67-16	790.000	67-43	793.375
66-17	784.125	66-44	787.500	67-17	790.125	67-44	793.500
66-18	784.250	66-45	787.625	67-18	790.250	67-45	793.625
66-19	784.375	66-46	787.750	67-19	790.375	67-46	793.750
66-20	784.500	66-47	787.875	67-20	790.500	67-47	793.875
66-21	784.625			67-21	790.625		
66-22	784.750			67-22	790.750		
66-23	784.875			67-23	790.875		
66-24	785.000			67-24	791.000		
66-25	785.125			67-25	791.125		
66-26	785.250			67-26	791.250		
66-27	785.375			67-27	791.375		

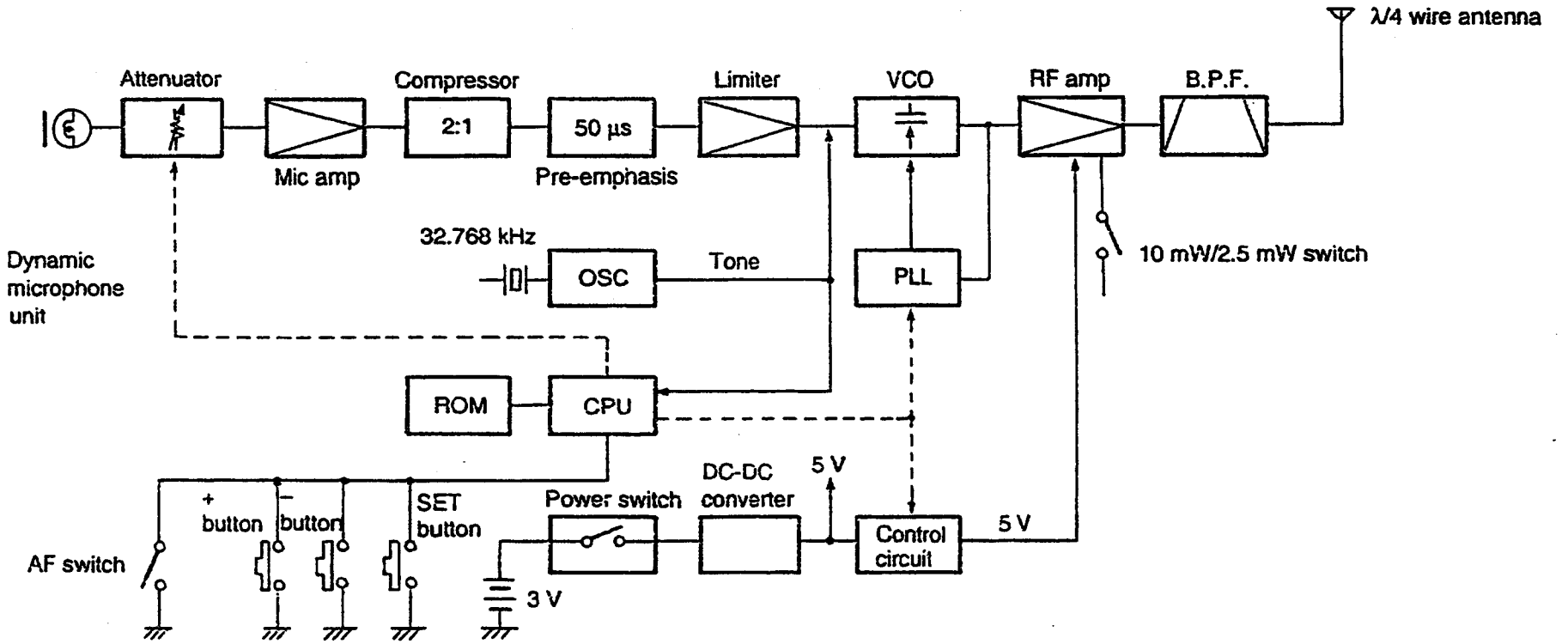
Channels and Carrier Frequencies

WRT-810A/820A(68)

Channel	Frequency (MHz) TV-68 Band	Channel	Frequency (MHz) TV-68 Band	Channel	Frequency (MHz) TV-69 Band	Channel	Frequency (MHz) TV-69 Band
68-01	794.125	68-28	797.500	69-01	800.125	69-28	803.500
68-02	794.250	68-29	797.625	69-02	800.250	69-29	803.625
68-03	794.375	68-30	797.750	69-03	800.375	69-30	803.750
68-04	794.500	68-31	797.875	69-04	800.500	69-31	803.875
68-05	794.625	68-32	798.000	69-05	800.625	69-32	804.000
68-06	794.750	68-33	798.125	69-06	800.750	69-33	804.125
68-07	794.875	68-34	798.250	69-07	800.875	69-34	804.250
68-08	795.000	68-35	798.375	69-08	801.000	69-35	804.375
68-09	795.125	68-36	798.500	69-09	801.125	69-36	804.500
68-10	795.250	68-37	798.625	69-10	801.250	69-37	804.625
68-11	795.375	68-38	798.750	69-11	801.375	69-38	804.750
68-12	795.500	68-39	798.875	69-12	801.500	69-39	804.875
68-13	795.625	68-40	799.000	69-13	801.625	69-40	805.000
68-14	795.750	68-41	799.125	69-14	801.750	69-41	805.125
68-15	795.875	68-42	799.250	69-15	801.875	69-42	805.250
68-16	796.000	68-43	799.375	69-16	802.000	69-43	805.375
68-17	796.125	68-44	799.500	69-17	802.125	69-44	805.500
68-18	796.250	68-45	799.625	69-18	802.250	69-45	805.625
68-19	796.375	68-46	799.750	69-19	802.375	69-46	805.750
68-20	796.500	68-47	799.875	69-20	802.500	69-47	805.875
68-21	796.625			69-21	802.625		
68-22	796.750			69-22	802.750		
68-23	796.875			69-23	802.875		
68-24	797.000			69-24	803.000		
68-25	797.125			69-25	803.125		
68-26	797.250			69-26	803.250		
68-27	797.375			69-27	803.375		

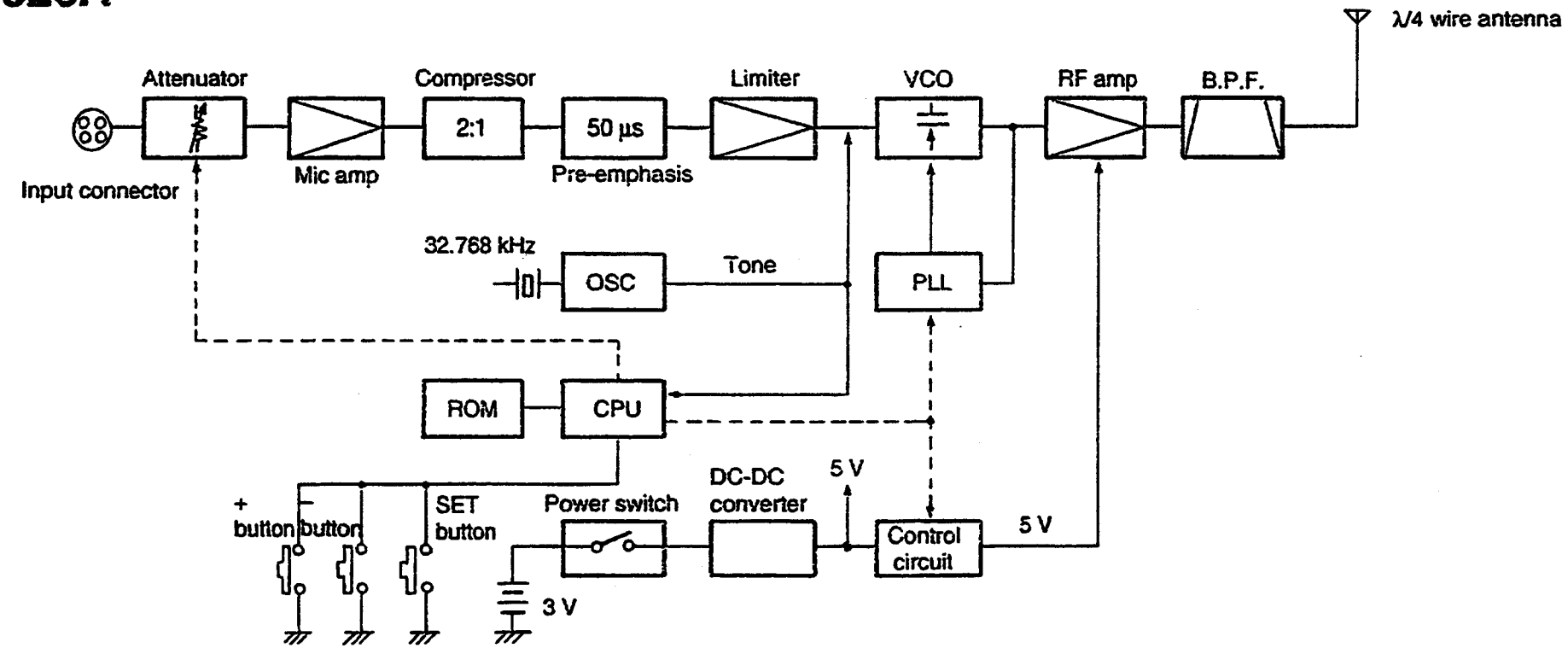
Block Diagram

WRT-810A



Block Diagram

WRT-820A



Indice

Introducción 23
Particularidades 25
Precauciones 26
Identificación de los controles y conectores 27
Colocación de las pilas 29
Cambio de selección de canal 30
Cambio del ajuste de atenuación de entrada 32
Utilización del micrófono/transmisor 35
Especificaciones 36
Canales y frecuencias portadoras 38
Diagrama en bloques 41

Introducción

El WRT-810A y el WRT-820A son transmisores para el sistema de micrófono inalámbrico sintetizado en la banda UHF de 800 MHz que se utilizan en las emisiones de TV o filmaciones de películas. Los otros componentes en el sistema son la antena UHF AN-820A, el divisor de antena UHF WD-820A y el sintonizador de recepción diferencial sintetizado WRR-820A/840A.

Los micrófonos/transmisores y los sintonizadores se clasifican por bandas de frecuencia. Vea el cuadro en la página siguiente.
Se le asigna una banda de frecuencia en 12 MHz (o dos canales de TV con números consecutivos) a cada modelo de micrófono/transmisor y sintonizador. Las bandas de frecuencia asignadas que aparecen entre paréntesis a continuación del nombre del modelo, en el cuadro, corresponden al menor del par de números de canal de TV asignados. Cuando se prepara un sistema de micrófonos inalámbricos en UHF, se debe combinar un micrófono/transmisor y un sintonizador que tengan el mismo número de canal de TV.

Banda de frecuencia		Nombre del modelo			
Canal de TV	Frecuencia (MHz)				
64	770,125 — 775,875	WRT-810A(64)	AN-820A	WD-820A	WRR-820A(64)
65	776,125 — 781,875	WRT-820A(64)			WRR-840A(64)
66	782,125 — 787,875	WRT-810A(66)			WRR-820A(66)
67	788,125 — 793,875	WRT-820A(66)			WRR-840A(66)
68	794,125 — 799,875	WRT-810A(68)			WRR-820A(68)
69	800,125 — 805,875	WRT-820A(68)			WRR-840A(68)